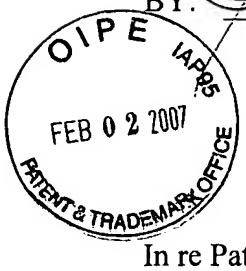
I HEREBY CERTIFY THAT THIS CORRESPONDENCE IS BEING DEPOSITED WITH THE UNITED STATES POSTAL SERVICE AS FIRST CLASS MAIL IN AN ENVELOPE ADDRESSED TO: MAIL STOP APPEAL BRIEF - PATENTS, COMMISSIONER FOR PATENTS, P.O. BOX 1450, ALEXANDRIA, VA 22313-1450, ON THE DATE INDICATED BELOW.

BY: Lucia C. Lanza Date: 1/26/07



MAIL STOP APPEAL BRIEF - PATENTS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of: Gregory P. Tzap et al.			
Conf. No.:	3397	Group Art Unit:	1711
Appln. No.:	10/642,873	Examiner:	Duc Truong
Filing Date:	August 18, 2003	Attorney Docket No.:	P0457-1U1

Title: MELAMINE RING-CONTAINING CO-POLYMERS; METHODS OF MAKING AND USING SAME

APPEAL BRIEF

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TABLE OF AUTHORITIES

Cases

Rules

I. REAL PARTY IN INTEREST

This application is assigned to Palmer International, Inc. by an Assignment recorded on August 18, 2003 at Reel 014407, beginning at Frame 0114. Accordingly, Palmer International, Inc. is the real party in interest.

II. RELATED APPEALS AND INTERFERENCES

Appellants, their assignees, and their legal representatives are unaware of any related appeals or interferences.

III. STATUS OF CLAIMS

Claims 1-30 are pending in this application. Claim 31 has been cancelled. Appellant added new claims 32-44 that were withdrawn from consideration by the Examiner as being directed to a non-elected invention as stated in the Final Official Action dated July 21, 2006.

In a Final Office Action mailed July 21, 2006, claims 1-30 were rejected under 35 U.S.C. § 103(a) on the grounds discussed below.

Claims 1-30 are appealed. The claims are set forth in the Claims Appendix.

IV. STATUS OF AMENDMENTS

All amendments have been entered.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The invention as set forth in claims 1 and 7, and dependent claims thereto, provides a melamine-ring containing co-polymer having constituents to the ring (specification page 8, lines 14 to 35, and page 9, lines 1-35). Claim 1 recites the melamine ring-containing co-polymer is the reaction product of at least one-melamine base resin and at least one reactant compound, wherein the at least one reactant compound comprises a cashew nut shell liquid "CNSL" and has at least one functional group selected from a carboxyl group, a hydroxyl group,

a thiol group and combinations thereof. CNSL, having compounds Cardol and Cardonal, is used as reactant product and have unique properties (specification page 10 lines 8 to 35 and page 11, lines 1 to 5).

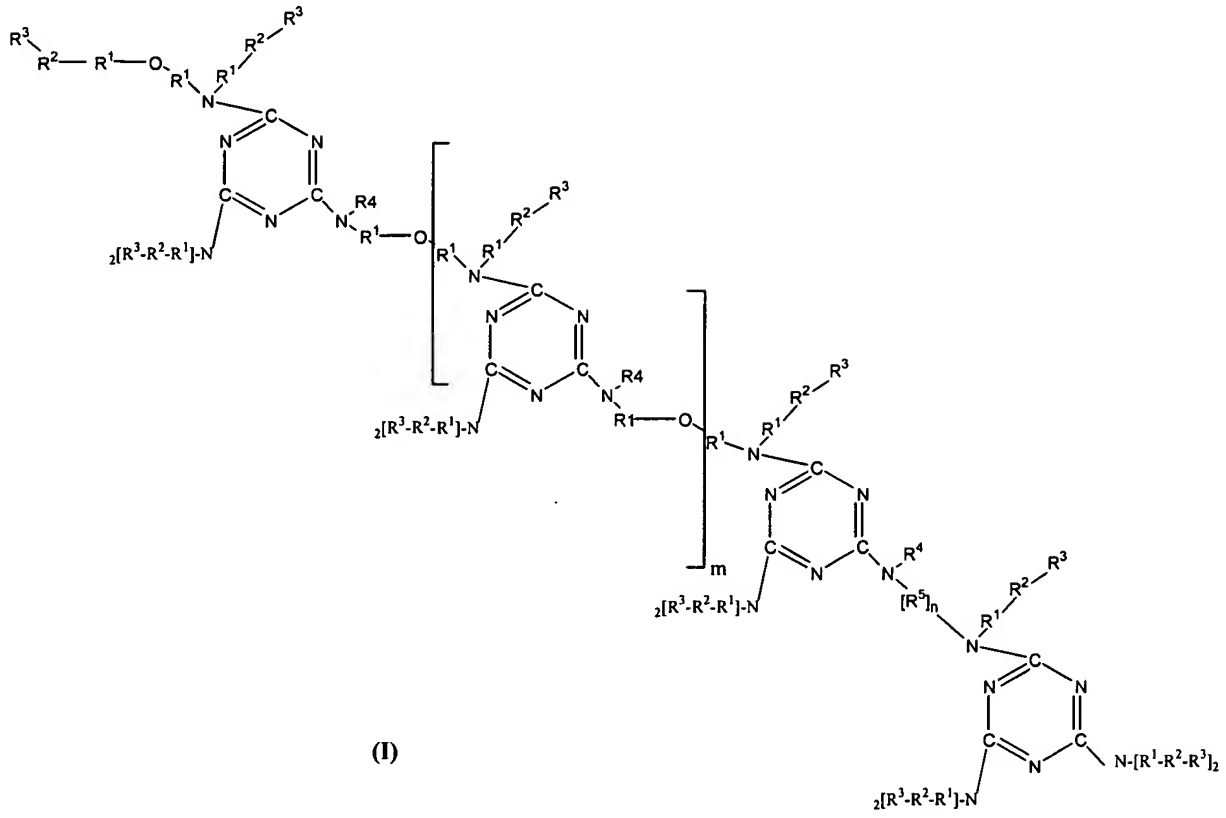
Claim 14 is directed to a method of preparing the melamine-ring containing co-polymer including the steps of reacting at least one-melamine base resin and at least one reactant compound, wherein the at least one reactant compound comprises a CNSL and has at least one functional group selected from a carboxyl group, a hydroxyl group, a thiol group and combinations (specification page 8, lines 13 to 17, and page 9 lines 1 to 14).

Claim 22 is directed to a surface having a coating which includes a melamine ring containing co-polymer having a variety of uses (specification page 15, lines 10 to 35).

Claim 23 is directed to a melamine ring containing co-polymer that is a reaction product of a CNSL and at least one melamine-formaldehyde resin wherein the cashew nutshell liquid comprises cardanol and cardol, and wherein the cardanol is present in an amount ranging from about 80% to about 100% by weight of the cashew nut shell liquid and the cardol is present in an amount ranging from about 1% to about 20% by weight of the CNSL (specification page 8 lines 27 to 33 and page 10 lines 13 to 17.

Dependent claims 15-17 and 24, are directed to a reaction involving catalysts to enhance and facilitate polymerization (specification page 11, lines 6 to 19).

The melamine ring-containing co-polymer of the present invention may be represented by formula (I):



(I)

wherein m is an integer of 1 to 100;

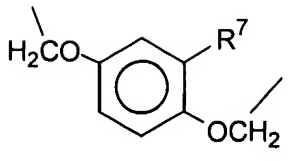
R^1 is independently selected from an alkyl group having one to twenty carbon atoms;

R^2 is independently selected from the group consisting of an oxygen atom and a sulfur atom;

R^3 is independently selected from an alkyl group, an allyl group, an alkynyl group, an aryl group, and a phenyl group, having one to seventy carbon atoms;

R^4 is independently selected from $-C_pH_{2p}OH$; $-C_pH_{2p-1}OH$; $-C_pH_{2p-2}OH$, wherein p is an integer of one to seven; a hydrogen atom; a carboxyl group, an alkyl group; an allyl group; and an alkynyl group;

R^5 is independently selected from the group consisting of an alkyl group, an alkyl group containing at least one ether linkage, and the group represented by the formula (III):



(III)

and;

n is an integer of one to thirty;

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Whether claims 1-30 are patentable over Chem Abstract 113:2131128 ("128") based on 35 U.S.C. § 103(a).

VII. ARGUMENT

A. INTRODUCTION

The Examiner has rejected all of the claims based Chem Abstract 128. The Examiner has withdrawn all other prior art references previously presented by him in the prosecution and the sole rejection under 35 U.S.C. § 103 (a) is based on this single Abstract. However, the prior art reference cited does not establish a case of *prima facie* obviousness nor does it disclose or suggest the Appellants' invention.

B. SUMMARY OF PRIMARY PRIOR ART REFERENCES

1. Chem abstract 128

For background, before presenting the specific rejection arguments below, and for the Board's convenience, Appellants have included the text of Chem Abstract 128, the sole remaining cited art reference

> Phosphorylated cardanol (I) prepolymers (II) were obtained by simultaneous phosphorylation and oligomerization of I, an unsatd. pentadecylphenol extracted from the nuts of the plant Anacardium occidentale. Although gel permeation chromatog. showed the presence of only oligomeric species in the system, the high viscosity of (0.35-0.45) + 106 cps was due to involvement of H bonding. IR spectra of II gave bands at 1030 cm-1 and 1240 cm-1, indicating P-O-C linkages. The decrease in iodine value and the absence of vinyl IR bands at 895 cm-1 and 907 cm-1

indicated oligomerization. NMR spectra of II showed partial loss of unsatn. A carbonium ion-initiated mechanism is indicated for the oligomerization. II was highly reactive with aldehydes, amines, and isocyanates. Highly insol. and infusible thermoset products could be obtained. TGA studies showed a 2-stage decomposition with improved thermal stability above 500° for II compared to I-HCHO (novolac-type) resin (III). II cured with hexamethylenetetramine (IV) had tensile strength of 16.9-21.5 MN/m2 and impact strength of 1.63-2.04 J compared to 24-48 MN/m2 and 1.35 J, resp., for phenol-HCHO resin prepared under similar conditions. The lap shear strength of II-bonded wood pieces was 400 ± 10 N/m2 compared to characteristics. With a P content of 7.9%, II showed good fire-retardant properties. Vertical burning studies showed no propagation of fire or any afterglow. IV-cured II had a limiting O-index value of 35, which increased to 42.0 on bromination.

Chem Abstract 128, (1 page).

C. THE EXAMINER HAS NOT ESTABLISHED *PRIMA FACIE* OBVIOUSNESS BASED ON THE CITED REFERENCE

Appellants respectfully submit that the Examiner has failed to establish a *prima facie case* of obviousness based upon Chem. Abstract 113: 213128.

Establishing *prima facie* obviousness based on a single reference in a chemical case is no different than in any other case. See M.P.E.P. § 2144.08. To establish a *prima facie case* of obviousness, the U.S. Patent Office must satisfy three requirements. First, the prior art reference or combination of references must teach or suggest all the limitations of the claims. *See In re Wilson*, 424 F.2d 1382, 1385 (C.C.P.A 1970); *see also* M.P.E.P. §§ 2142-43. Second, the prior art relied upon, coupled with the knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or to combine references. *See Karsten Mfg. Corp. v. Cleveland Gulf Co.*, 242 F.3d 1376, 1385 (Fed. Cir. 2001). Third, the suggested modified prior art must indicate a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. In other words, hindsight analysis is not allowed. *See Amgen Inc. v. Chugai Pharm. Co.*, 927 F.2d 1200, 1209 (Fed. Cir. 1991); *In re Erlich*, 3 U.S.P.Q.2d 1011, 1016 (Bd. Pat. App. & Int. 1986).

In addition to the foregoing, "[t]he examiner bears the initial burden of factually supporting any prima facie conclusion of obviousness." M.P.E.P. § 2142 (*citations omitted*). These findings should be made with a complete understanding of 1) a determination of the scope and content of the cited art, 2) appreciation of the differences between the prior art and claimed invention and 3) the level of the one of ordinary skill in the pertinent art. *See Graham v. John Deere,* 383 U.S. 1, 17 (1966).

1. The 128 reference does not teach or suggest each limitation in the claimed invention.

Appellants respectfully submit that the cited reference does not teach or suggest all the limitations of the claimed invention. Specifically, as admitted by the Examiner in the Office Action dated July 21, 2006, the 128 reference does not suggest or teach 1) the melamine ring containing co-polymer of claimed formula (I) as in all of the rejected claims, or 2) the use of catalysts, as recited in claims 15-17 and 24, discussed herein. Further, the cited reference does not disclose or suggest the use of cashew nut shell liquid. The 128 reference merely discloses polymerizing melamine with cardanol. In contrast, the present invention requires not only melamine resin and cardanol as reactants, but further requires cardol as a reactant as the claims recite; a melamine base resin and cashew nut shell liquid. CNSL is readily known in the art to include both cardanol and cardol.

The Examiner further contends that one of the missing elements (*i.e.,* formula (I)) is inherent in the prior art because "all of the references disclose the reactants under process conditions of the original claims, therefore, the claimed product of the formula I must be considered inherent in the prior art." *See* September 21, 2005 Office Action. Appellants respectfully submit that the Examiner has failed to provide a rationale or evidence tending to show the inherency of formula (I).

"The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic." M.P.E.P. § 2112 (*citing In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993). "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill in the art.

Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'" *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999), *see also* M.P.E.P. § 2112.

Claims 1, 7, 14 and 22

Independent claims 1, 7, 14 and 22 include the limitation of formula (I). However, claims 1 and 14 further include the limitation of "CNSL" which is not disclosed in the cited reference. Furthermore, claims 7 and 22 does not include any reactant or process limitations as contended by the Examiner as the basis for an inherent disclosure. The fact that formula (I) may result from the myriad of possibilities of reacting similar reactants under similar conditions is insufficient to establish the inherency of formula (I).

Claims 15-17 and 24

Regarding dependent claims 15-17 and 24, these claims are directed to a reaction involving catalysts, a known area of unpredictability. Catalytic activity "can not be forecast by chemical composition, for such action is not understood and is not known except by actual test." *Corona Cord Tire Co. v. Dovan Chem. Corp.*, 276 U.S. 358, 368-69 (1928); *see also In re Slocombe*, 184 U.S.P.Q. 740, 744 (C.C.P.A. 1975) ("catalytic effects are a particularly unpredictable art in the field of chemistry"). The 128 abstract is silent as to catalysts thereby giving no direction for their use in the present invention nor any guidance regarding how the inclusion of a catalyst would effect the system.

In *In re Mercier*, 185 U.S.P.Q. 774 (C.C.P.A. 1975), a patent applicant appealed from a decision of the Board of Appeals and Interferences rejecting claims covering a method of splitting acetals and hemi-acetals. The claims called for the step of passing an acetal or hemi-acetal upwardly through a fluidized catalyst, where the catalyst is a sulfonic ion exchange resin in acid form. The claims had been rejected over a reference teaching the use of an ion exchange resin catalyst for hydrolysis of esters. *See id.* at 777.

On appeal, the Court of Customs and Patent Appeals (the predecessor to the Court of Appeals for the Federal Circuit) reversed the Examiner's obviousness rejection, concluding that while the cited reference taught the use of acetals, it did not teach the equivalency between

acetals and esters for the claimed reaction. The Court stated that the disclosure of a "known relationship" between acetals and esters "does nothing more than teach that it would be *obvious to try*, which is insufficient under section 103." *Id.* at 779. The Court reasoned that "[m]any compounds have a known relationship but are not equivalents for substitution in different reactions." *Id.* The Court also found that the unpredictability in the art of catalytic reactions supported the non-obviousness of the claimed process, and stated:

> The conclusion that appellant's invention would have been nonobvious to one having ordinary skill in the art on the basis of the cited art is further buttressed by the fact that the claimed invention is a catalytic process. The unpredictability of catalytic phenomena has long been recognized by this court. As previously noted, [the prior art] disclosure is relied upon by the board for the proposition that organic oxygen-containing compounds, including acetals, may be hydrolyzed using the catalyst of appellant's invention. This does not render the process of applicant's invention any less unpredictable, because a successfully catalyzed process depends not only on the particular catalyst that may be employed but also on the environment within which the catalysis is accomplished.

Id. at 779-80.

In addition, Appellants' respectfully submit that unpredictability also exists when using different monomers as starting reactant materials. Having different monomers reactant in different environment will change the resultant product. Though it is appreciated that a melamine ring is common to the monomer of the present invention and the 128 abstract, the constituent groups which make up the monomers of the present invention and the 128 abstract are different. As the structure of the basic monomer is different its properties and reactions with other reactants will be unpredictable resulting in an unpredictability of the resultant product.

As such, the 128 reference fails to disclose or suggest numerous critical reactants and thus does not teach or suggest all the elements of the presently claimed invention. Thus, for these reasons and the arguments provide above, Appellant respectfully submits that 128 does not disclose or suggest all the elements of the present invention.

2. No motivation to modify the 128 reference to obtain the claimed invention

Appellants respectfully submit that the cited reference does not provide any motivation to one skilled in the art to modify the reference to arrive at the presently claimed invention. Moreover, the Examiner has not specifically cited any motivation to modify the reference accordingly. As discussed in more detail below, the cited reference merely discloses reactants to produce a material in the area of adhesives, phenolic resins and heat/fire resistant materials. Specifically, the 128 abstract discloses 1, 3, 5-triazine-2, 4, 6-triamine (melamine), polymerized with cardanol, as recognized by the Examiner. *See* December 27, 2004 Office Action. As such, the Examiner contends that it would have been obvious to one of ordinary skill in the art to arrive at the present invention in view of 128. As noted, the Examiner has never addressed any specific reason as a motivation to modify the reference but it is clear, based on the differences in structure, elements and use, that the properties of the present invention and cited reference are different. An important aspect regarding "motivation" to modify is the likelihood that the claimed invention would have the properties disclosed by the prior art teaching. See M.P.E.P. § 2144.08.

The Examiner in the Official Actions dated July 21, 2006, January 23, 2006, June 23, 2005 and December 27, 2004 does not give any specific reasons for motivation but comments it would be within one skilled in the art to do so. More specifically, the Examiner has never established a determination of the scope and content of the cited art so as to clearly give the Appellant an understanding of what he believes is the differences between the prior art and claimed invention, as mandated by *Graham v. John Deere,* to establish a *prima facie* case for obviousness. Specifically, the Examiner has not addressed reactions that may occur to obtain the resultant product or the structures of the resultant product. Appellants have previously requested that the Examiner, in the Amendment dated May 23, 2006, to specifically reference what reactants and under what same or similar conditions are disclosed in the cited reference to suggest to one of ordinary skill in the art that the resultant composition will necessarily result in the claimed compound. Appellants did not receive any comment or compliance in response to the request and believes that no "conditions" exists which would make the present invention obvious.

3. The 128 reference does not give any reasonable expectation of success.

Appellants further submit that there is no reasonable expectation of success for any modification of the cited reference. One of ordinary skill in the art cannot simply take various components and combine them without a commonality of purpose or characteristics that gives the artisan some reasonable expectation of success. "Chemical compounds present special issues of obviousness because of the limited number of elements, recurring groups or substitutes in complex molecules, the structural similarities within classes of related compounds, and the ability of chemists to undertake systematic experiments modifying known compounds." *Eli Lilly and Co. v. Zenith Goldline Pharmaceuticals, Inc.* 2001 U.S. Dist. LEXIS 18361 at *14 (S.D. Ind. 2001). "For a chemical compound, a prima facie case of obviousness requires 'structural similarity between claimed and prior art subject matter ... *where the prior art gives reason or motivation to make the claimed compositions*'." *Yamanouchi Pharmaceutical Co., Ltd v. Danbury Pharmacal, Inc.*, 231 F.3d 1339, 1343 (Fed. Cir. 2000), *quoting In re Dillon*, 919 F.2d 688, 692 (Fed. Cir. 1990) (*en banc*) (emphasis added).

Here, the Examiner contends that;

> to select reactants under conditions from the reference within the limitation of the instant claims to get the product of the claimed formula is the level of ordinary skill in the art and would have been obvious in the absence of a showing of unexpected results derived from said selection.

See July 21, 2006 Office Action. Assuming *arguendo*, that the cited references provide motivation to make the claimed co-polymer, the Examiner has not shown "structural similarity" between the claimed co-polymer and that disclosed in the cited reference because there is no disclosure of any structure in any of the cited reference, for which the Examiner has already admitted and made of record. See July 21, 2006 Office Action.

The cited reference at best would fall into a category of "obvious to try," without a reasonable expectation of success. However, "obvious to try" without a reasonable expectation of success is not the standard under 35 U.S.C. § 103. The proper test requires determining what the prior art would have led the skilled person to do. In *In re O'Farrell*, 853 F.2d 894, 903 (Fed. Cir. 1988), the Court of Appeals for the Federal Circuit stated:

> In some cases, what would have been "obvious to try" would have been to vary all parameters or try each of numerous possible choices until one possibly arrived at a successful result, where the prior art gave either no indication of which parameters were critical or no direction as to which of many possible choices is likely to be successful. In other words, what was "obvious to try" was to explore a new technology or general approach that seemed to be a promising field of experimentation, where the prior art gave only general guidance as to the particular form of the claimed invention or how to achieve it.

An "obvious to try" situation exists when a general disclosure may pique the scientist's curiosity, such that further investigation might be done as a result of the disclosure itself, but the disclosure does not contain a sufficient teaching of how to obtain the desired result, or that the claimed result would be obtained if certain directions were pursued. As discussed herein, the cited reference, merely provides reactants similarly used in the claimed invention with no indication of what reactants or what reaction / process conditions are critical. Thus, a myriad of possibilities exits without any indication of what is likely to be successful to arrive at the present invention.

In evaluating obviousness, the courts have made it very clear that one must look to see if "the prior art would have suggested to one of ordinary skill in the art that [the] process should be carried out and would have a reasonable likelihood of success, viewed in the light of the prior art." *In re Dow Chemical Co.*, 837 F.2d 469, 473 (Fed. Cir. 1988). "Both the suggestion and the expectation of success must be found in the prior art, *not in the Applicant's disclosure.*" *Id.* (emphasis added). Appreciating this in the current situation, the Examiner therefore contends that it would have been obvious to one skilled in the art to select the reactants under conditions from the reference within the limitations of the instant claims since they have been shown to be effective in a similar system. Appellant respectfully submits that the Examiner has improperly attempted to establish obviousness by using the Appellants' disclosure as a road map as opposed to the prior art references cited.

D. THE EXAMINER FAILED TO CONSIDER SECONDARY CONSIDERATION WHICH EXIST THAT WOULD SUPPORT A FINDING OF NON-OBVIOUSNESS

The Examiner has failed to consider the secondary considerations that exist which would support a finding that the present invention is not obvious in view of the 128 Abstact. Specifically, as illustrated in Example 1, the co-polymer of the present invention can be prepared in approximately half of the time and at a lower temperature compared to the manufacture of conventional synthetic resins. This further supports the Appellants' argument that the co-polymer of the present invention is non-obvious in view of the cited art.

CONCLUSION

For the reasons set forth above, the Examiner's rejections based on 35 U.S.C. § 103(a) of claims 1-30 should be withdrawn and the a Notice of Allowance accordingly issued.

Respectfully submitted,

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By: _____

1/26/07
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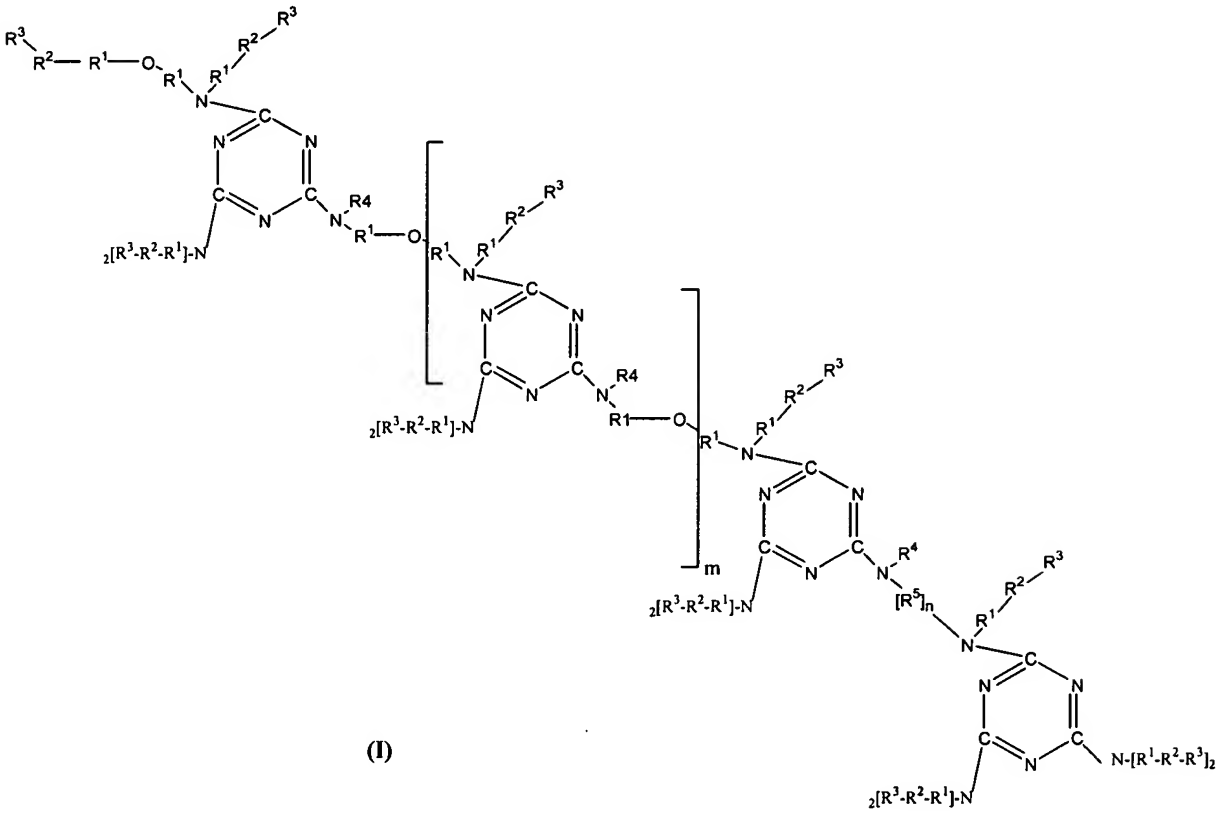
VIII. CLAIMS APPENDIX

Claim 1. A melamine ring-containing co-polymer of formula (I)



(I)

wherein m is an integer of 1 to 100;

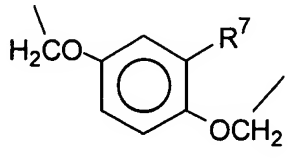
R^1 is independently selected from the group consisting of an alkyl group having one to twenty carbon atoms;

R^2 is independently selected from the group consisting of an oxygen atom and a sulfur atom;

R^3 is independently selected from the group consisting of an alkyl group, an allyl group, an alkynyl group, an aryl group, and a phenyl group, having one to seventy carbon atoms;

R^4 is independently selected from the group consisting of $-C_pH_{2p}OH$; $-C_pH_{2p-1}OH$; $-C_pH_{2p-2}OH$, wherein p is an integer of one to seven; a hydrogen atom; a carboxyl group, an alkyl group; an allyl group; and an alkynyl group;

R^5 is independently selected from the group consisting of an alkyl group, an alkyl group containing at least one ether linkage, and the group represented by the formula (III):



(III)

wherein R^7 is independently a C_{10}-C_{40} branched or unbranched, substituted or unsubstituted alkyl, allyl, or alkynyl group, and;

n is an integer of one to thirty;

wherein the melamine ring-containing co-polymer is the reaction product of at least one melamine base resin and at least one reactant compound, wherein the at least one reactant compound comprises a cashew nut shell liquid and has at least one functional group selected from a carboxyl group, a hydroxyl group, a thiol group and combinations thereof.

Claim 2. The co-polymer of claim 1, wherein the cashew nut shell liquid comprises cardanol and cardol.

Claim 3. The co-polymer of claim 1, wherein the at least one reactant compound further comprises a fatty acid.

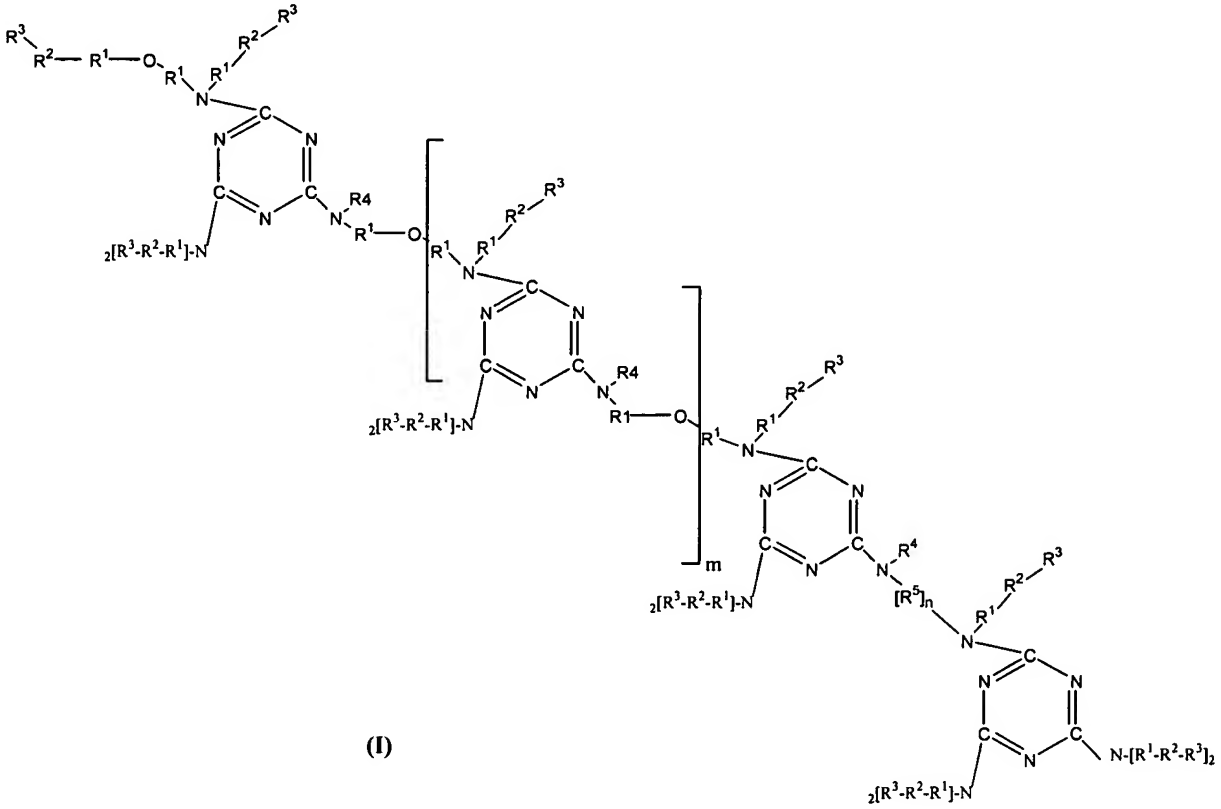
Claim 4. The co-polymer of claim 3, wherein the fatty acid is selected from the group consisting of lauric acid, myristic acid, palmitic acid, stearic acid, arachidic acid, palmitoleic acid, oleic acid, ricinoleic acid, linoleic acid, arachidonic acid, and combinations thereof.

Claim 5. The co-polymer of claim 1, wherein the at least one reactant compound further comprises at least one compound which is selected from the group consisting of dodecyl mercaptan, phenyl mercaptan, lauryl thioglycolate, octyl thioglycolate, and mixtures thereof.

Claim 6. The co-polymer of claim 1, wherein the at least one melamine base resin is modified or unmodified and is selected from the group consisting of a melamine resin, a melamine-

formaldehyde resin, a melamine-urea-formaldehyde resin, methylated melamine formaldehyde, and combinations thereof.

Claim 7. A melamine ring-containing co-polymer of formula (I):



(I)

wherein m is an integer of 1 to 100;

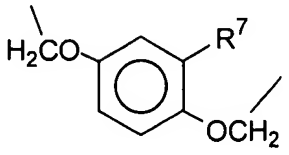
R^1 is independently selected from the group consisting of an alkyl group having one to twenty carbon atoms;

R^2 is independently selected from the group consisting of an oxygen atom and a sulfur atom;

R^3 is independently selected from the group consisting of an alkyl group, an allyl group, an alkynyl group, an aryl group, and a phenyl group, having one to seventy carbon atoms;

R^4 is independently selected from the group consisting of $-C_pH_{2p}OH$; $-C_pH_{2p-1}OH$; $-C_pH_{2p-2}OH$, wherein p is an integer of one to seven; a hydrogen atom; a carboxyl group, an alkyl group; an allyl group; and an alkynyl group;

R^5 is independently selected from the group consisting of an alkyl group, an alkyl group containing at least one ether linkage, and the group represented by the formula (III):



(III)

wherein R^7 is independently a C_{10}-C_{40} branched or unbranched, substituted or unsubstituted alkyl, allyl, or alkynyl group, and;

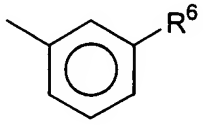
n is an integer of one to thirty.

Claim 8. The co-polymer of claim 7, wherein R^1 is independently selected from the group consisting of an alkyl group having two to seven carbon atoms.

Claim 9. The co-polymer of claim 7, wherein at least one of R^3 is independently selected from the group consisting of an alkyl group, an allyl group, an alkynyl group, an aryl group, and a phenyl group having thirty to sixty carbon atoms.

Claim 10. The co-polymer of claim 7, wherein at least one of R^3 is independently selected from the group consisting of an alkyl group, an allyl group, an alkynyl group, an aryl group, and a phenyl group having six to twelve carbon atoms.

Claim 11. The co-polymer of claim 7, wherein at least one R^3 is a structure represented by the formula (II):



(II)

wherein R^6 is independently selected from the group consisting of an alkyl group, an allyl group, and an alkynyl group having ten to forty carbon atoms.

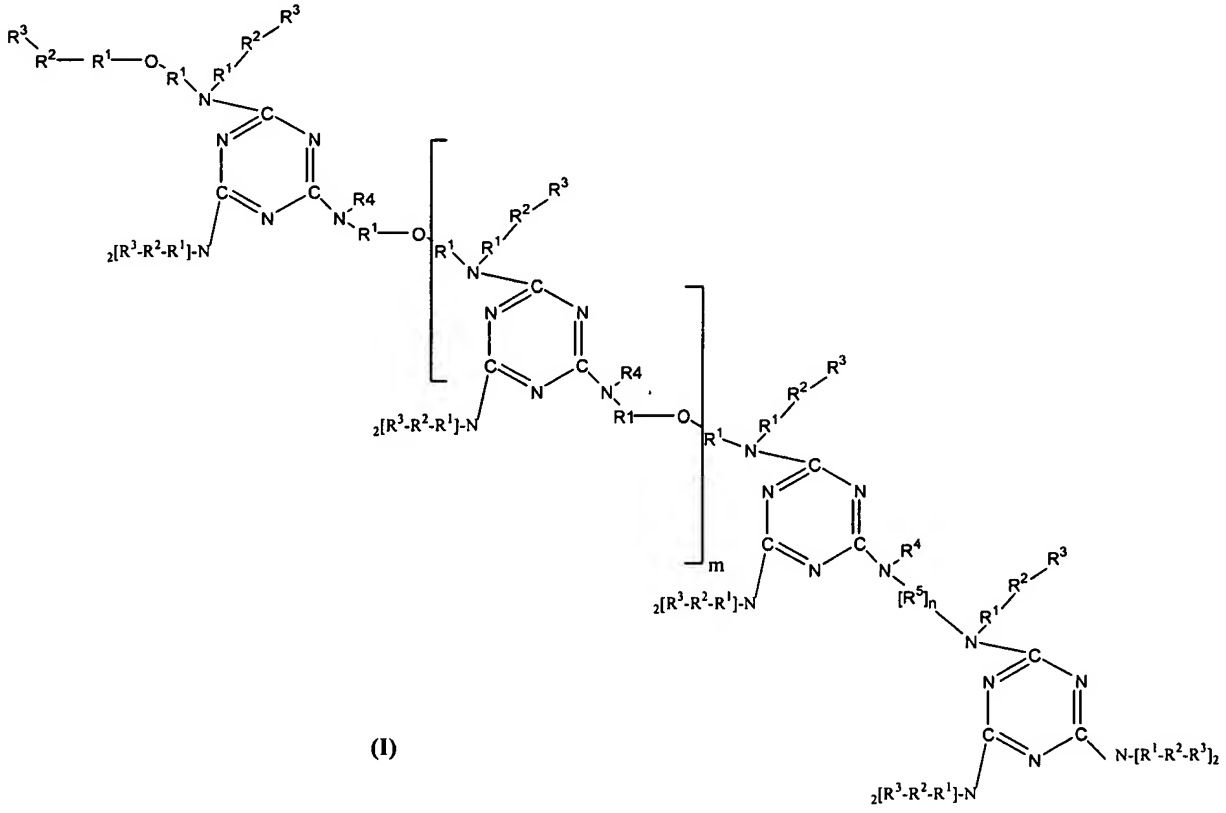
Claim 12. The co-polymer of claim 11, wherein R^6 is independently selected from the group consisting of an alkyl group, an allyl group, and an alkynyl group having fifteen to thirty carbon atoms.

Claim 13. The co-polymer of claim 11, wherein R^6 is independently selected from the group consisting of $-(CH_2)_7CH = CH-(CH_2)_5CH_3$; $-(CH_2)_7CH = CHCH_2CH = CH(CH_2)_2CH_3$; $-(CH_2)_7CH = CHCH_2CH = CHCH_2CH{=}CH_2$; and $-(CH_2)_{14}CH_3$.

Claim 14. A method of preparing a melamine ring-containing co-polymer comprising:

reacting at least one melamine base resin with at least one reactant compound;

wherein the reactant compound comprises cashew nut shell liquid and has at least one functional group selected from a carboxyl group, a hydroxyl group, a thiol group and combinations thereof, wherein the copolymer has formula (I):



(I)

wherein m is an integer of 1 to 100;

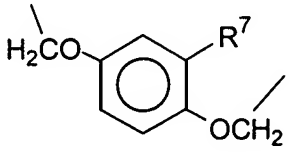
R^1 is independently selected from the group consisting of an alkyl group having one to twenty carbon atoms;

R^2 is independently selected from the group consisting of an oxygen atom and a sulfur atom;

R^3 is independently selected from the group consisting of an alkyl group, an allyl group, an alkynyl group, an aryl group, and a phenyl group, having one to seventy carbon atoms;

R^4 is independently selected from the group consisting of $-C_pH_{2p}OH$; $-C_pH_{2p-1}OH$; $-C_pH_{2p-2}OH$, wherein p is an integer of one to seven; a hydrogen atom; a carboxyl group, an alkyl group; an allyl group; and an alkynyl group;

R^5 is independently selected from the group consisting of an alkyl group, an alkyl group containing at least one ether linkage, and the group represented by the formula (III):



(III)

wherein R^7 is independently a C_{10}-C_{40} branched or unbranched, substituted or unsubstituted alkyl, allyl, or alkynyl group, and;

n is an integer of one to thirty.

Claim 15. The method of claim 14, wherein the reaction is carried out in the presence of a proton-donating catalyst.

Claim 16. The method of claim 15, wherein the catalyst is a sulfo radical containing catalyst.

Claim 17. The method of claim 15, wherein the catalyst is selected from the group consisting of methanesulfonic acid, phosphoric acid, nitric acid, oxalic acid, maleic acid, hexamic acid, phthalic acid, acrylic acid, para-toluene sulfonic acid, dinonyl naphthalene sulfonic acid, magnesium bromide, zinc nitrate, aluminum nitrate, magnesium nitrate, and combinations thereof.

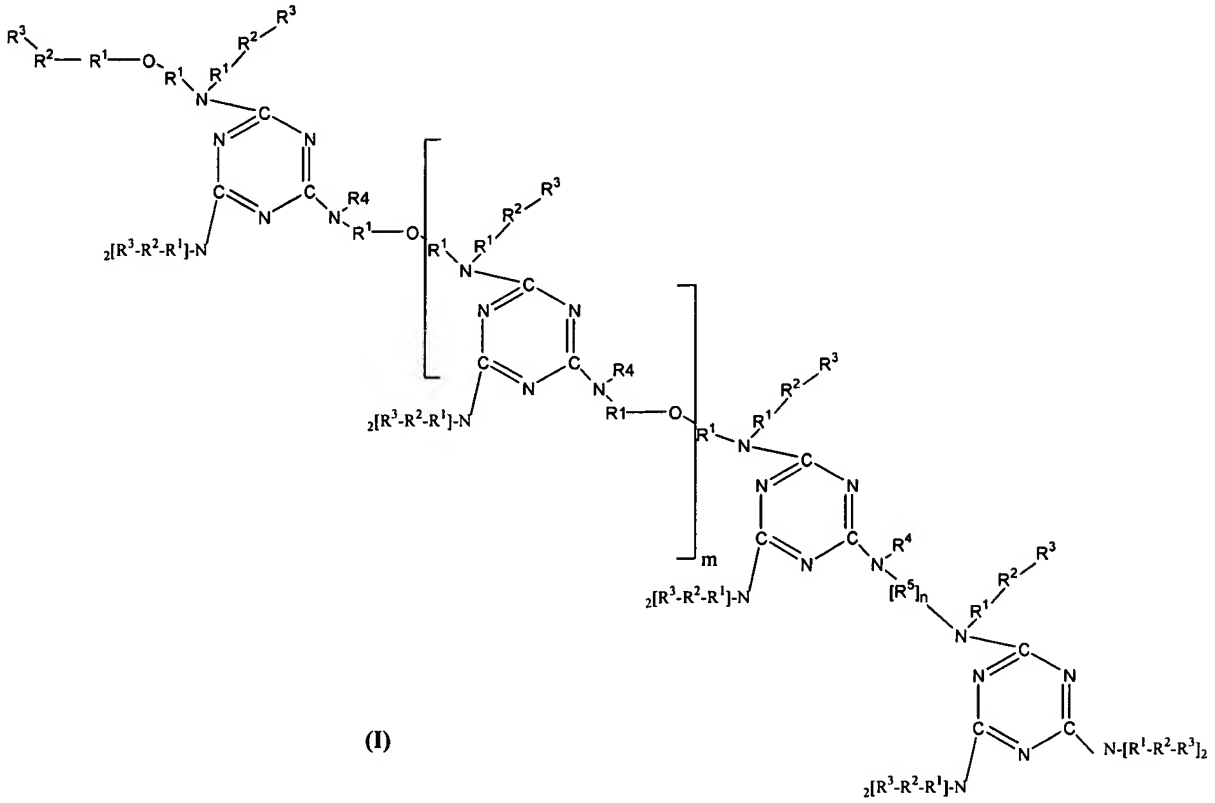
Claim 18. The method of claim 14, wherein the at least one reactant compound comprises cardol and cardanol.

Claim 19. The method of claim 14, wherein the at least one reactant compound comprises a fatty acid.

Claim 20. The method of claim 19, wherein the fatty acid is selected from the group consisting of lauric acid, myristic acid, palmitic acid, stearic acid, arachidic acid, palmitoleic acid, oleic acid, ricinoleic acid, linoleic acid, arachidonic acid, and combinations thereof.

Claim 21. The method of claim 14, wherein the at least one ~~base~~ melamine base resin is modified or unmodified and is selected from the group consisting of a-melamine resin, a melamine-formaldehyde resin, a melamine-urea-formaldehyde resin, methylated melamine formaldehyde, and combinations thereof.

Claim 22. A surface having a coating, wherein the coating comprises a melamine ring-containing co-polymer having the structure of formula (I):



(I)

wherein m is an integer of 1 to 100;

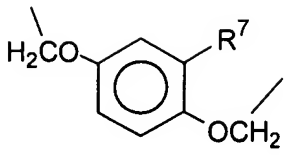
R^1 is independently selected from the group consisting of an alkyl group having one to twenty carbon atoms;

R^2 is independently selected from the group consisting of an oxygen atom and a sulfur atom;

R^3 is independently selected from the group consisting of an alkyl group, an allyl group, an alkynyl group, an aryl group, and a phenyl group, having one to seventy carbon atoms;

R^4 is independently selected from the group consisting of $-C_pH_{2p}OH$; $-C_pH_{2p-1}OH$; $-C_pH_{2p-2}OH$, wherein p is an integer of one to seven; a hydrogen atom; a carboxyl group, an alkyl group; an allyl group; and an alkynyl group;

R^5 is independently selected from the group consisting of an alkyl group, an alkyl group containing at least one ether linkage, and the group represented by the formula (III):



(III)

wherein R^7 is independently a C_{10}-C_{40} branched or unbranched, substituted or unsubstituted alkyl, allyl, or alkynyl group, and;

n is an integer of one to thirty.

Claim 23. A melamine ring containing co-polymer that is a reaction product of a cashew nut shell liquid and at least one melamine-formaldehyde resin wherein the cashew nutshell liquid comprises cardanol and cardol, and wherein the cardanol is present in an amount ranging from about 80% to about 100% by weight of the cashew nut shell liquid and the cardol is present in an amount ranging from about 1% to about 20% by weight of the cashew nut shell liquid.

Claim 24. The melamine ring containing co-polymer of claim 23, wherein the reaction is carried out in the presence of a proton-donating catalyst.

Claim 25. The melamine ring containing co-polymer of claim 23, wherein the at least one melamine resin comprises a methylated melamine formaldehyde resin.

Claim 26. The method of claim 23, wherein the cashew nutshell liquid is in the form of a cashew nut shell liquid distillate.

Claim 27. The copolymer of claim 1, wherein the at least one melamine base resin is a methylated melamine formaldehyde resin.

Claim 28. The melamine ring containing co-polymer of claim 1, wherein the cashew nutshell liquid comprises cardanol and cardol, and wherein the cardanol is present in an amount ranging from about 80% to about 100% by weight of the cashew nut shell liquid and the cardol is present in an amount ranging from about 1% to about 20% by weight of the cashew nut shell liquid.

Claim 29. The melamine ring containing co-polymer of Claim 28 that is a reaction product of a cashew nut shell liquid and at least one melamine-formaldehyde resin, wherein the cashew nutshell liquid comprises cardanol and cardol, and wherein the cardanol is present in an amount ranging from about 96% to about 98% by weight of the cashew nut shell liquid and the cardol is present in an amount ranging from about 2% to about 4% by weight of the cashew nut shell liquid.

Claim 30. The co-polymer of claim 23, wherein the cardanol is present in an amount ranging from about 96% to about 98% by weight of the cashew nut shell liquid and the cardol is present in an amount ranging from about 2% to about 4% by weight of the cashew nut shell liquid.

IX. EVIDENCE APPENDIX

None.

X. RELATED PROCEEDINGS APPENDIX

None.